

AMENDMENTS TO THE CLAIMS

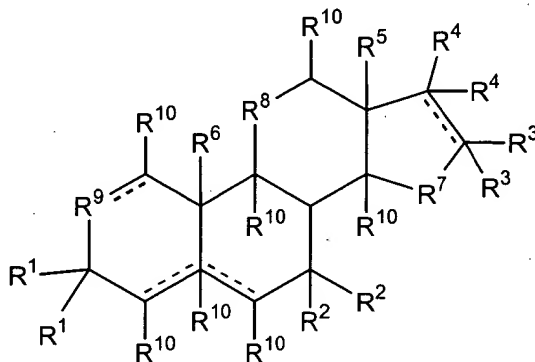
This list replaces prior versions of the claims.

Claims 1-82 (cancelled)

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Claim 83 (currently amended): A method to treat or slow the progression of a condition selected from the group consisting of a lipid disorder elevated cholesterol, elevated low density lipoprotein, elevated triglyceride and arteriosclerosis in a subject having ~~or susceptible to developing~~ the condition comprising administering to the subject an effective amount of a compound having the formula

10



wherein,

one R¹ is -OH, -SH, -SR^{PR}, -N(R^{PR})₂, -NO₂, -Br, -I, -OSO₃H, -OPO₃H, an ester, a thioester, a phosphoester, a phosphothioester, a phosphonoester, a phosphiniester, a sulfite ester, a sulfate ester, an amide, an amino acid, a peptide, a thioether, a carbonate, a carbamate, a thioacetal, an optionally substituted monosaccharide or an optionally substituted oligosaccharide;

the other R¹ is -H, -CHO, -CHS, -CH=NH, -Br, -I, -CN, -SCN, a thioacyl group, a thioacetal, an alkyl group, an optionally substituted alkenyl group, an optionally substituted alkynyl group, an optionally substituted aryl moiety, an optionally substituted heteroaryl moiety, an optionally substituted heterocycle, an optionally substituted monosaccharide, an optionally substituted oligosaccharide, a nucleoside, a nucleotide, an oligonucleotide or a polymer;

20

one R² is -OH, -SH, -SR^{PR}, -N(R^{PR})₂, -NO₂, -OSO₃H, -OPO₃H, -Br, -I, an ester, a thioester, a phosphoester, a phosphothioester, a phosphonoester, a phosphiniester, a sulfite ester, a sulfate ester, an amide, an amino acid, a peptide, a carbonate, a carbamate, a thioacetal, an optionally substituted monosaccharide or an optionally substituted oligosaccharide;

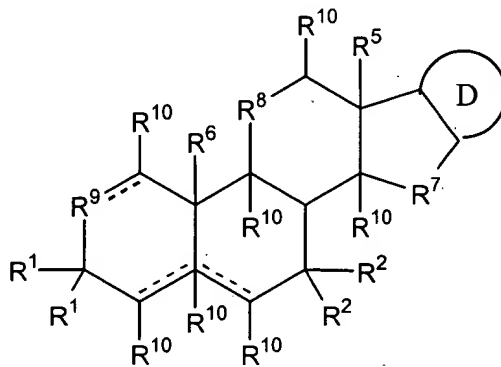
the other R² is -H, -CHO, -CHS, -CH=NH, -CN, -SCN, -Br, -I, an amide, an amino acid, a peptide, an acyl group, a thioacyl group, a thioacetal, an optionally substituted alkyl group, an optionally substituted alkenyl group, an optionally substituted alkynyl group, an optionally substituted aryl moiety, an optionally substituted heteroaryl moiety, an optionally substituted heterocycle, an optionally substituted monosaccharide, an optionally substituted oligosaccharide, a nucleoside, a nucleotide, an oligonucleotide or a polymer, or both R² together are =O or =S;

R³ independently or together are -H, -OH, -OR^{PR}, =O, -SH, -SR^{PR}, =S, =N-OH, -N(R^{PR})₂, -O-Si-(R¹³)₃, -CHO, -CHS, =CH₂, =CH(CH₂)₀₋₁₅CH₃, -CH=NH, -CN, -SCN, -NO₂, -OSO₃H, -OPO₃H, -F, -Cl, -Br, -I, an ester, a thioester, an amide, an amino acid, a peptide, an ether, a thioether, an acyl group, a thioacyl group, a carbonate, a carbamate, a thioacetal, an optionally substituted alkyl group, an optionally substituted alkenyl group, an optionally substituted alkynyl group, an optionally substituted aryl moiety, an optionally substituted heteroaryl moiety, an optionally substituted heterocycle or a spiro ring;

one R⁴ is -OH, -SH, -SR^{PR}, -N(R^{PR})₂, -O-Si-(R¹³)₃, -CN, -SCN, -NO₂, -OSO₃H, -OPO₃H, -Br, -I, an ester, a thioester, a phosphoester, a phosphothioester, a phosphonoester, a phosphiniester, a sulfite ester, a sulfate ester, an amide, an amino acid, a peptide, a thioether, a thioacyl group, a carbonate, a carbamate, a thioacetal, an optionally substituted heterocycle, a spiro ring, an optionally substituted monosaccharide, an optionally substituted oligosaccharide;

the other R⁴ is -H, -CHO, -CHS, -CH=NH, -CN, -SCN, -NO₂, -F, -Cl, -Br, -I, an alkyl group, an optionally substituted alkenyl group, an optionally substituted alkynyl group, an optionally substituted aryl moiety, an optionally substituted

heteroaryl moiety, an optionally substituted heterocycle, or R^4 together are $=NOH$, $=CH_2$ or $=CH(CH_2)_{0-15}CH_3$, or R^3 and R^4 together comprise a compound having the formula



- 5 R^5 and R^6 independently are -H, -OH, $-OR^{PR}$, -SH, $-SR^{PR}$, $-N(R^{PR})_2$, -CHO, -CHS, -CH=NH, -CN, -SCN, $-NO_2$, -F, -Cl, -Br, -I, an ester, a thioester, an amide, an amino acid, a peptide, an ether, a thioether, an acyl group, a thioacyl group, a carbonate, a carbamate, a thioacetal, an optionally substituted alkyl group, an optionally substituted alkenyl group or an optionally substituted alkynyl group;
- 10 R^{10} independently are -H, -OH, $-OR^{PR}$, =O, -SH, $-SR^{PR}$, =S, =N-OH, $-N(R^{PR})_2$, $-O-Si(R^{13})_3$, -CHO, -CHS, $=CH_2$, $=CH(CH_2)_{0-15}CH_3$, -CH=NH, -CN, -SCN, $-NO_2$, -F, -Cl, -Br, -I, an ester, a thioester, a phosphoester, a phosphothioester, a phosphonoester, a phosphiniester, a sulfite ester, a sulfate ester, an amide, an amino acid, a peptide, an ether, a thioether, an acyl group, a thioacyl group, a carbonate, a carbamate, a thioacetal, an optionally substituted alkyl group, an optionally substituted alkenyl group, an optionally substituted alkynyl group, an optionally substituted aryl moiety, an optionally substituted heteroaryl moiety, an optionally substituted heterocycle, a spiro ring, an optionally substituted monosaccharide, an optionally substituted oligosaccharide,
- 15 a nucleoside, a nucleotide, an oligonucleotide, a polymer, or one or more of two adjacent R^1-R^6 and R^{10} comprise an independently selected ketal or thioacetal;
- 20 R^7 is $-C(R^{10})_2-$, $-C(R^{10})_2-C(R^{10})_2-$, $-C(R^{10})_2-C(R^{10})_2-C(R^{10})_2-$, $-C(R^{10})_2-O-C(R^{10})_2-$, $-C(R^{10})_2-S-C(R^{10})_2-$, $-C(R^{10})_2-NR^{PR}-C(R^{10})_2-$, -O-, $-O-C(R^{10})_2-$, -S-, $-S-C(R^{10})_2-$, $-NR^{PR}-$ or $-NR^{PR}-C(R^{10})_2-$;

R^8 and R^9 independently are $-C(R^{10})_2-$, $-C(R^{10})_2-C(R^{10})_2-$, $-O-$, $-O-C(R^{10})_2-$, $-S-$, $-S-C(R^{10})_2-$, $-NR^{PR}-$ or $-NR^{PR}-C(R^{10})_2-$, or one or both of R^8 or R^9 independently are absent, leaving a 5-membered ring;

R^{13} independently are C_{1-6} alkyl;

5 R^{PR} independently are $-H$ or a protecting group;

D is a heterocycle or a 4-, 5-, 6- or 7-membered ring that comprises saturated carbon atoms, wherein 1, 2 or 3 ring carbon atoms of the 4-, 5-, 6- or 7-membered ring are optionally independently substituted with $-O-$, $-S-$ or $-NR^{PR}-$ or where 1, 2 or 3 hydrogen atoms of the heterocycle or where 1, 2 or 3 hydrogen atoms of the 4-, 5-, 6- or 7-membered ring are substituted with $-OR^{PR}$, $-SR^{PR}$, $-N(R^{PR})_2$, $-O-Si-(R^{13})_3$, $-CHO$, $-CHS$, $-CH=NH$, $-CN$, $-SCN$, $-NO_2$, an ester, a thioester, a phosphoester, a phosphothioester, a phosphiniester, a sulfite ester, a sulfate ester, an amide, an amino acid, a peptide, an ether, a thioether, an acyl group, a thioacyl group, a carbonate, a carbamate, a thioacetal, a halogen, an optionally substituted alkyl group, an optionally substituted alkenyl group, an optionally substituted alkynyl group, an optionally substituted aryl moiety, an optionally substituted heteroaryl moiety, an optionally substituted heterocycle, an optionally substituted monosaccharide, an optionally substituted oligosaccharide, a nucleoside, a nucleotide, an oligonucleotide or a polymer, or,

20 one more of the ring carbons are substituted with $=O$, $=S$, $=N-OH$, $=CH_2$, or a spiro ring, or

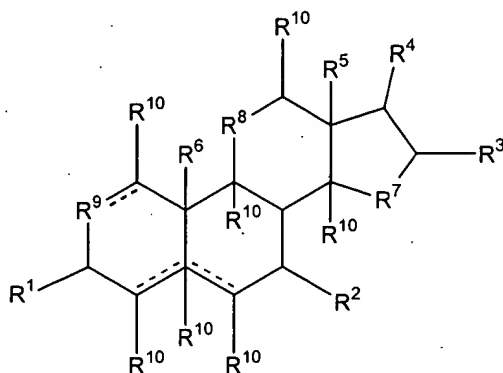
D comprises two 5- or 6-membered rings, wherein the rings are fused or are linked by 1 or 2 bonds.

25 Claim 84 (currently amended): The method of claim 83 wherein the condition is a ~~lipid disorder~~ elevated low density lipoprotein.

Claim 85 (currently amended): The method of ~~claim 84~~ claim 83 wherein the ~~lipid disorder~~ condition is elevated cholesterol ~~cholesterol~~, elevated triglyceride or ~~elevated low density lipoprotein~~.

Claim 86 (previously added): The method of claim 83 wherein the condition is arteriosclerosis.

5 Claim 87 (previously added): The method of claim 83 wherein the compound has the formula



wherein, R⁴ is -OH, -SH, -SR^{PR}, -N(R^{PR})₂, -O-Si-(R¹³)₃, =CH₂, =CH(CH₂)₀₋₁₅-CH₃, -CH=NH, -OSO₃H, -OPO₃H, -Br, -I, an ester, a thioester, a phosphoester, a phosphothioester, a phosphonoester, a phosphiniester, a sulfite ester, a sulfate ester, an amide, an amino acid, a peptide, a thioether, a thioacyl group, a carbonate, a carbamate, a thioacetal, an optionally substituted heterocycle, a spiro ring, an optionally substituted monosaccharide or an optionally substituted oligosaccharide.

15 88. (currently amended): The method of claim 83 wherein

R⁷ is -CH₂- or -CH₂-CH₂-;

R⁸ is -CH₂- or -O-;

R⁹ is -CH₂-, -CH(OH)-, -O- or -CH(halogen)-;

20 ~~R¹⁰ at the 1, 4, 5, 6, 9, 12 or 14 position is one R¹⁰ at the 1, 4 or 6 position~~
is -OH, -OR^{PR}, =O, -SH, -SR^{PR}, =S, =N-OH, -N(R^{PR})₂, -O-Si-(R¹³)₃, -CHO, -CHS, =CH₂, =CH(CH₂)₀₋₁₅CH₃, -CH=NH, -CN, -SCN, -NO₂, -F, -Cl, -Br, -I, an ester, a thioester, an amide, an amino acid, a peptide, an ether, a thioether, an acyl group, a thioacyl group, a carbonate, a carbamate, a thioacetal, an optionally substituted alkyl group, an optionally substituted alkenyl group, an optionally substituted alkynyl group, an optionally substituted aryl moiety, an optionally

substituted heteroaryl moiety, an optionally substituted heterocycle, a spiro ring, an optionally substituted monosaccharide, an optionally substituted oligosaccharide, a nucleoside, a nucleotide, an oligonucleotide, a polymer, a ketal or a thioketal and the remaining R^{10} are -H.

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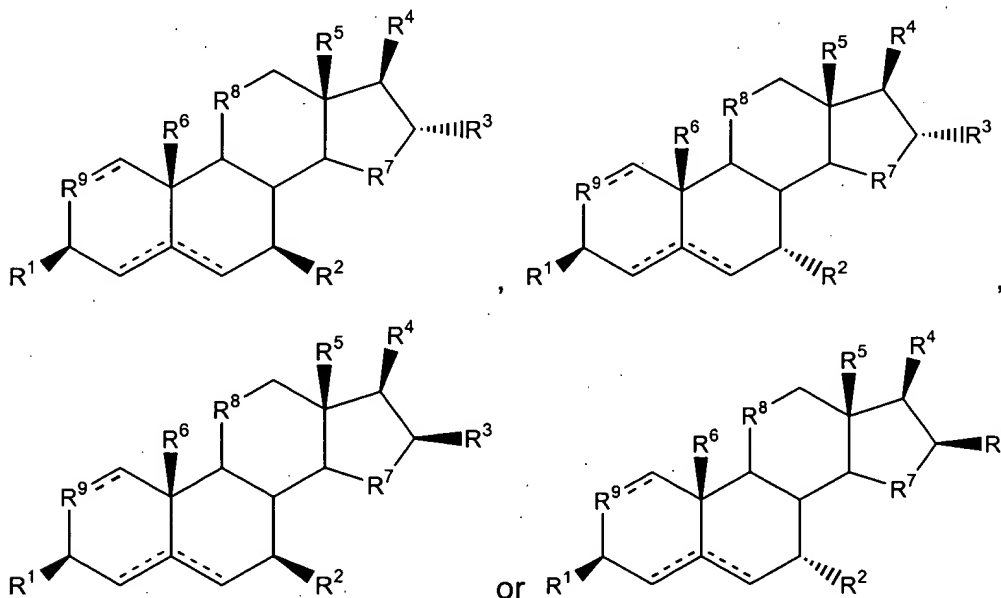
Claim 89 (previously added): The method of claim 88 wherein the R^{10} is at the 1 position.

10 Claim 90 (previously added): The method of claim 89 wherein the R^{10} at the 1 position is -OH, =O, -F, -Cl, -Br, -I, an ester, an ether or a carbonate.

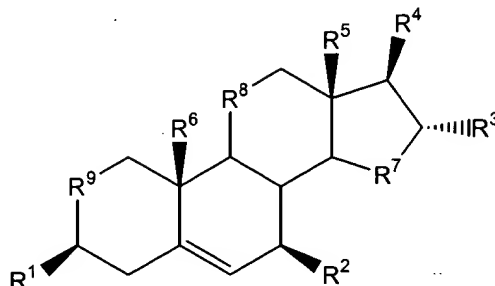
Claim 91 (currently amended): The method of claim 88 wherein the R^{10} is at the 12 position the 6 position.

15 Claim 92 (currently amended): The method of claim 89 wherein the R^{10} at the 12 position the 6 position is -OH, =O, -F, -Cl, -Br, -I, an ester, an ether or a carbonate.

20 Claim 93 (previously added): The method of claim 83 wherein the compound has the formula



Claim 94 (previously added): The method of claim 93 wherein the compound has the formula



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Claim 95 (previously added): The method of claim 94 wherein R² is -OH, -SH, -SR^{PR}, -N(R^{PR})₂, an ester, a thioester, a phosphoester, a phosphothioester, a phosphonoester, a phosphiniester, a sulfite ester, a sulfate ester, an amide, an amino acid, a peptide, a carbonate, a carbamate, a thioacetal, an optionally substituted monosaccharide or an optionally substituted oligosaccharide.

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Claim 96 (currently amended): The method of claim 95 wherein the ~~cardiovascular condition is a lipid disorder~~ condition is arteriosclerosis.

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Claim 97 (currently amended): The method of claim 96 wherein the ~~lipid disorder~~ condition is elevated cholesterol.

Claim 98 (previously added): The method of claim 97 wherein R¹, R² and R⁴ are -OH, R³ is -H, R⁵ and R⁶ are -CH₃, R⁷, R⁸ and R⁹ are -CH₂- and hydrogen atoms at the 8, 9 and 14 positions respectively are in the β-, α- and α-configurations.

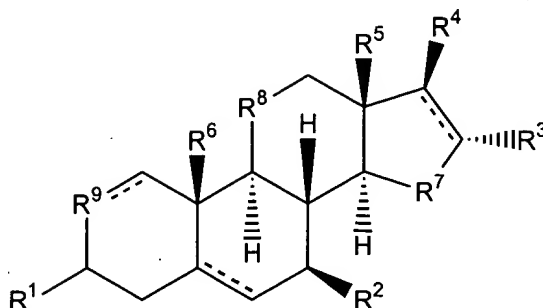
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Claim 99 (previously added): The method of claim 97 wherein R¹, R² and R⁴ are -OH, R³ is -H, R⁵ and R⁶ are -CH₃, R⁷ is -O-, R⁸ and R⁹ are -CH₂- and hydrogen atoms at the 8, 9 and 14 positions respectively are in the β-, α- and α-configurations.

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Claims 100-112 (cancelled)

Claim 113 (new): The method of claim 83 wherein compound has the
5 structure



wherein R¹, if bonded by a single bond, is in the α -configuration or the β -configuration.

10 Claim 114 (new): The method of claim 113 wherein

R¹ is -OH, =O -SH, =S, -OCH₃, -O-S(O)(O)-O⁻Na⁺, -O-S(O)(O)-OC₂H₅, -H, -OC(O)C(CH₃)₃, -O-C(O)-CH₂CH₂CH₂CH₃, -O-C(O)-CH₂CH₂CH₂CH₂CH₂CH₃, -O-C(O)-CH₂CH₂OCH₂CH₃, -O-C(O)-CH₂CH₂OCH₂CH₂OCH₂CH₃, -O-C(O)-CH₂CH₂CH₂CH₂OCH₂CH₃, -O-C(O)-CH₂CH₂OCH₂CH₂CH₂CH₃, -O-C₆H₄Cl, -O-C₆H₃F₂, -O-C₆H₄-O(CH₂)₂-O-CH₂CH₃, -O-C₆H₄-C(O)O(CH₂)₀₋₉CH₃;

R² is -OH, -SH, =S, -CH₃, -OCH₃, -OC₂H₅, -OCH₂CH₂CH₃ or -OCH₂CH₂CH₂CH₃;

R³ is -H, -OH, -Br, -I, -O-C(O)-CH₃, -O-C(O)-CH₂CH₃ or -O-C(O)-CH₂CH₂CH₃;

20 R⁴ is -OH, -O-C(O)-CH₃, -O-C(O)-CH₂CH₃, -O-C(O)-CH₂CH₂CH₃, -O-C(O)-O-CH₃, -O-C(O)-CF₃, -O-C(O)-O-CH₂CH₃, -O-C(O)-O-C₃H₇, -O-C(O)-O-C₄H₉, -O-C(O)-O-C₆H₁₃, -O-C(O)-O-C₆H₅, -O-C(O)-O-C₆H₄OH, -O-C(O)-O-C₆H₄OCH₃, -O-C(O)-O-C₆H₄OCH₂CH₃, -O-C(O)-O-C₆H₄F;

R⁵ is -CH₃ or -CH₂OH;

25 R⁶ is -CH₃ or -H;

R⁷ is -CH₂-, -CH₂-CH₂- or -S-;

R^8 is $-\text{CH}_2-$, $-\text{O}-$ or $-\text{NH}-$; and

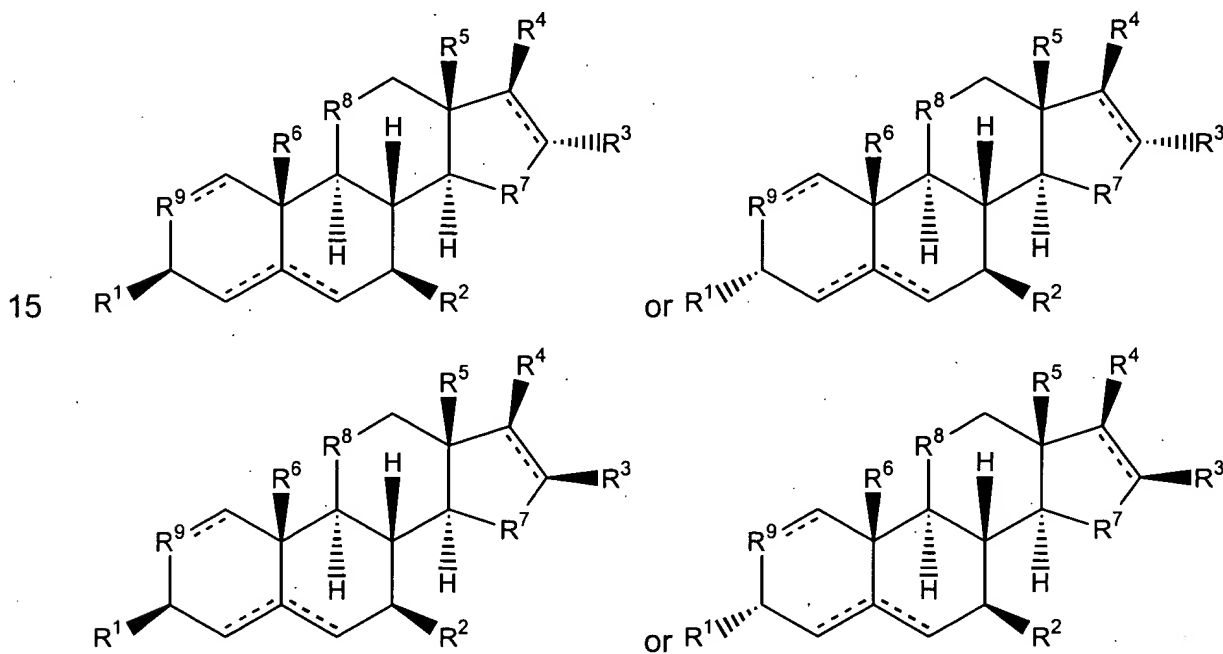
R^9 is $-\text{CH}_2-$, $=\text{CH}-$, $-\text{O}-$, $-\text{S}-$ or $-\text{NH}-$.

Claim 115 (new): The method of claim 114 wherein a double bond is
5 present at the 5-position.

Claim 116 (new): The method of claim 115 wherein the compound is
 $3\beta,7\beta,17\beta$ -trihydroxyandrost-5-ene and the condition is elevated cholesterol.

10 Claim 117 (new): The method of claim 114 wherein a double bond is
present at the 1-position.

Claim 118 (new): A formulation comprising one or more excipients and a
compound having the structure



wherein,

R^1 is $-\text{H}$, $-\text{OH}$, $-\text{SH}$, $-\text{OCH}_3$, $-\text{O}-\text{S}(\text{O})(\text{O})-\text{O}^-\text{Na}^+$, $-\text{O}-\text{S}(\text{O})(\text{O})-\text{OC}_2\text{H}_5$, $-\text{H}$, $-\text{OC}(\text{O})\text{C}(\text{CH}_3)_3$, $-\text{O}-\text{C}(\text{O})-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-$
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$\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{O}-\text{C}_6\text{H}_4\text{Cl}$, $-\text{O}-\text{C}_6\text{H}_3\text{F}_2$, $-\text{O}-\text{C}_6\text{H}_4-\text{O}(\text{CH}_2)_2-\text{O}-\text{CH}_2\text{CH}_3$, $-\text{O}-\text{C}_6\text{H}_4-\text{C}(\text{O})\text{O}(\text{CH}_2)_{0-9}\text{CH}_3$;

R^2 is $-\text{OH}$, $-\text{SH}$, $-\text{CH}_3$, $-\text{OCH}_3$, $-\text{OC}_2\text{H}_5$, $-\text{OCH}_2\text{CH}_2\text{CH}_3$ or -

$\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$;

5 R^3 is $-\text{OH}$, $-\text{SH}$, $-\text{F}$, $-\text{Cl}$, $-\text{Br}$, $-\text{I}$, $-\text{O}-\text{C}(\text{O})-\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-\text{CH}_2\text{CH}_3$ or $-\text{O}-\text{C}(\text{O})-\text{CH}_2\text{CH}_2\text{CH}_3$;

R^4 is $-\text{OH}$, $-\text{SH}$, $-\text{O}-\text{C}(\text{O})-\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-\text{CH}_2\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-\text{CH}_2\text{CH}_2\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-\text{O}-\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-\text{CF}_3$, $-\text{O}-\text{C}(\text{O})-\text{O}-\text{CH}_2\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-\text{O}-\text{C}_3\text{H}_7$, $-\text{O}-\text{C}(\text{O})-\text{O}-\text{C}_4\text{H}_9$, $-\text{O}-\text{C}(\text{O})-\text{O}-\text{C}_6\text{H}_{13}$, $-\text{O}-\text{C}(\text{O})-\text{O}-\text{C}_6\text{H}_5$, $-\text{O}-\text{C}(\text{O})-\text{O}-\text{C}_6\text{H}_4\text{OH}$, $-\text{O}-\text{C}(\text{O})-\text{O}-$

10 $\text{C}_6\text{H}_4\text{OCH}_3$, $-\text{O}-\text{C}(\text{O})-\text{O}-\text{C}_6\text{H}_4\text{OCH}_2\text{CH}_3$, $-\text{O}-\text{C}(\text{O})-\text{O}-\text{C}_6\text{H}_4\text{F}$;

R^5 is $-\text{CH}_3$ or $-\text{CH}_2\text{OH}$;

R^6 is $-\text{CH}_3$ or $-\text{H}$;

R^7 is $-\text{CH}_2-$ or $-\text{CH}_2-\text{CH}_2-$;

R^8 is $-\text{CH}_2-$, $-\text{O}-$ or $-\text{NH}-$; and

15 R^9 is $-\text{CH}_2-$, $=\text{CH}-$, $-\text{O}-$, $-\text{S}-$ or $-\text{NH}-$.

Claim 119 (new): The formulation of claim 118 wherein R^3 is $-\text{F}$, $-\text{OH}$ or $-\text{Br}$.